



Editorial

Multidisciplinary Perspectives on the Importance of Physical Activity in COPD



Perspectivas multidisciplinares sobre la importancia de la actividad física en la EPOC

 Marc Miravittles^{a,*}, Thierry Troosters^{a,b}, Wim Janssens^{a,c}, Julio Ancochea^d
^a Pulmonology Department, Vall d'Hebron University Hospital/Vall d'Hebron Research Institute, Respiratory Diseases Networking Biomedical Research Centre (CIBERES), Barcelona

^b Department of Rehabilitation Sciences, Katholieke Universiteit Leuven, Leuven Belgium and Respiratory Division, University Hospital Gasthuisberg, Leuven, Belgium

^c Department of Chronic Disease, Metabolism and Ageing, Katholieke Universiteit Leuven, Leuven Belgium and Respiratory Division, University Hospital Gasthuisberg, Leuven, Belgium

^d Pulmonology Department, La Princesa University Hospital, La Princesa University Hospital Research Institute (IISP), Autonomous University of Madrid, Spain

Physical inactivity is an 'epidemic' in the 21st century. Large proportions of the population have physical activity levels below those that are needed for healthy ageing. Physical activity is known to have significant benefits in primary and secondary prevention of cardiovascular disease, mental disorders, type 2 diabetes, colon cancer and breast cancer. Surprisingly though, only one-third of adults and two-thirds of children and adolescents is regularly taking part in physical activities during leisure time.

The situation is even more worrying for chronic obstructive pulmonary disease (COPD), as patients with this disease often have very low levels of physical activity compared to healthy peers.^{1,2} Physical inactivity is a very early feature of COPD, affecting individuals unaware of their disease, i.e. in people with undiagnosed and untreated COPD,³ suggesting that it sneaks in independently of a subject's perception of disease and long before clinical illness becomes apparent. It is important to consider why patients diagnosed with COPD lead less active lives, as in many cases these reasons are linked with false beliefs, e.g. that dyspnoea or fatigue is negatively affecting their health or with disease specific fears, rather than purely physiologic limitations.⁴ For these reasons, it is important for health care professionals to collect data on the physical activity of their COPD patients and to help eliminate any misconceptions patients may have when taking part in these activities.⁵ Research on the impact of physical activity (or inactivity) on COPD has advanced significantly over the last twenty years and has shown that low levels of physical activity are associated with a greater frequency of exacerbations, hospitalisations, worse quality of life and, ultimately, an increased risk of death.^{6,7} Furthermore, increasing physical activity in COPD may lead to significant improvements in quality of life and even to a reduced loss of pulmonary function.^{8,9}

There is abundant information and marketing on drug prescription in COPD, but health care professionals, even today, receive little information on the importance of a physically active lifestyle and ways to achieve this.¹⁰ For this reason, the tenth edition of the "Avances en EPOC" symposium was held on 15 and 16 February 2019 at the University of Leuven (Belgium) under the title "Small steps that change lives". This edition had a mixed audience of participants, including Belgian and Spanish specialists in the fields of pulmonology, physiotherapy, rehabilitation and psychology. They debated various aspects of non-pharmacological treatment of COPD, primarily based on the importance of physical activity, the measurement of physical activity, pulmonary rehabilitation, the psychological aspects of physical activity in COPD and the impact of symptoms and exacerbations. Leuven was not chosen by chance, as it is a top-tier centre for research on rehabilitation and physical activity in COPD.^{1,3,6,11,12} The theoretical presentations were supplemented by a visit to the university hospital rehabilitation facilities, where most of the centre's research is carried out. Some of the numerous aspects on which the attendees focused, included the vicious circle of dyspnoea, fear of physical activity, inactivity, the increased risk of exacerbation, reduction in exercise capacity and, finally, how to comprehensively tackle this.¹³ They debated the barriers to engage in physical activity coaching, including both structural barriers within the health care system and those due to the perceptions of professionals and of the patients themselves.

One key point for a comprehensive treatment of COPD patients is to combine pharmacological and non-pharmacological strategies. In this regard, the first step would be to optimise pulmonary function and reduce gas trapping using powerful bronchodilators, combined with pulmonary rehabilitation to increase the patient's exercise capacity.^{11,12,14} Behavioural interventions to change sedentary habits and to adopt a more active lifestyle are equally important.¹⁵ By combining both strategies, patients' levels of physical activity will increase more efficiently than by using any one of its components separately.¹¹ It is true that this strategy

* Corresponding author.

 E-mail address: marcm@separ.es (M. Miravittles).

requires greater involvement of the professionals and often a multidisciplinary approach, but the benefit obtained is unquestionable and justifies the effort required to implement it.

Finally, one new concept is the possibility of using new technologies to help with the task of increasing our patients' levels of physical activity. An entire series of devices such as pedometers and accelerometers, which are increasingly more reliable, user-friendly and cheap, allow us to monitor our patients' activities and, more importantly, provide feedback that helps patients to set goals and earn rewards as an essential method for motivation.⁵ Such devices will generate a wealth of data and proper data-management including automated processing and artificial intelligence may be a way forward to keep efforts clinically feasible.

The comments received during the meeting clearly showed that there is a broad consensus on the importance of physical activity in COPD, although significant progress still needs to be made on how to implement pulmonary rehabilitation and how to engage patients in a more active lifestyle within daily medical practice.

Conflicts of interest

Marc Miravittles has received speaker fees from AstraZeneca, Boehringer Ingelheim, Chiesi, Cipla, AstraZeneca, Menarini, Rovi, Bial, Zambon, CSL Behring, Grifols and Novartis, consulting fees from AstraZeneca, Boehringer Ingelheim, Chiesi, GlaxoSmithKline, Bial, Gebro Pharma, CSL Behring, Laboratorios Esteve, Ferrer, Mereo Biopharma, Verona Pharma, TEVA, pH Pharma, Novartis and Grifols and research grants from GlaxoSmithKline and Grifols.

Julio Ancochea has received speaker fees from Air Liquide, AstraZeneca, Boehringer Ingelheim, Chiesi, GlaxoSmithKline, Linde Healthcare, Mundipharma, Novartis, Roche and Rovi, consulting fees from Air Liquide, AstraZeneca, Boehringer Ingelheim, Chiesi, FAES Farma, GlaxoSmithKline, Linde Healthcare, Roche and Rovi, and research grants from Chiesi, GlaxoSmithKline, Linde Healthcare, Menarini and Roche.

Wim Janssens has received speaker and consulting fees from AstraZeneca, Boehringer Ingelheim, Chiesi, GlaxoSmithKline, Novartis. He received Research grant from Chiesi, Boehringer Ingelheim and AstraZeneca.

Thierry Troosters's institution has received speaker and consulting fees from Boehringer Ingelheim and AstraZeneca for his services.

Acknowledgements

The X "Avances en EPOC" symposium was held on 15 and 16 February 2019 at the University of Leuven (Belgium), sponsored by Boehringer Ingelheim.

References

1. Vorrink SN, Kort HS, Troosters T, Lammers JW. Level of daily physical activity in individuals with COPD compared with healthy controls. *Respir Res.* 2011;12:33.
2. Ramon MA, Esquinas C, Barrecheguren M, Pleguezuelos E, Molina J, Quintano JA, et al. Self-reported daily walking time in COPD: relationship with relevant clinical and functional characteristics. *Int J Chronic Obstr Pulm Dis.* 2017;12:1173–81.
3. Van Remoortel H, Hornikx M, Demeyer H, Langer D, Burtin C, Decramer M, et al. Daily physical activity in subjects with newly diagnosed COPD. *Thorax.* 2013;68:962–3.
4. Danilack VA, Weston NA, Richardson CR, Mori DL, Moy ML. Reasons persons with COPD do not walk and relationship with daily step count. *COPD.* 2014;11:290–9.
5. Pleguezuelos E, Gimeno-Santos E, Hernández C, Mata MDC, Palacios L, Piñera P, et al. Recommendations on non-Pharmacological Treatment in Chronic Obstructive Pulmonary Disease From the Spanish COPD Guidelines (GesEPOC 2017). *Arch Bronconeumol.* 2018;54:568–75.
6. Demeyer H, Costilla-Frias M, Louvaris Z, Gimeno-Santos E, Tabberer M, Rabinovich RA, et al. PROactive Consortium. Both moderate and severe exacerbations accelerate physical activity decline in COPD patients. *Eur Respir J.* 2018;51, pii:1702110.
7. Garcia-Aymerich J, Lange P, Benet M, Schnohr P, Anto JM. Regular physical activity reduces hospital admission and mortality in chronic obstructive pulmonary disease: a population based cohort study. *Thorax.* 2006;61:772–8.
8. Esteban C, Quintana JM, Aburto M, Moraza J, Egurrola M, Pérez-Izquierdo J, et al. Impact of changes in physical activity on health-related quality of life among patients with COPD. *Eur Respir J.* 2010;36:292–300.
9. Waschki B, Kirsten AM, Holz O, Mueller KC, Schaper M, Sack AL, et al. Disease progression and changes in physical activity in patients with chronic obstructive pulmonary disease. *Am J Respir Crit Care Med.* 2015;192:295–306.
10. Pleguezuelos E, Miravittles M. Prescription of physical activity in chronic obstructive pulmonary disease... and beyond. *Med Clin (Barc).* 2017;149:24–5.
11. Troosters T, Maltais F, Leidy N, Lavoie KL, Sedeno M, Janssens W, et al. Effect of bronchodilation exercise training, and behavior modification on symptoms and physical activity in chronic obstructive pulmonary disease. *Am J Respir Crit Care Med.* 2018;198:1021–32.
12. Osadnik CR, Loeckx M, Louvaris Z, Demeyer H, Langer D, Rodrigues FM, et al. The likelihood of improving physical activity after pulmonary rehabilitation is increased in patients with COPD who have better exercise tolerance. *Int J Chronic Obstr Pulm Dis.* 2018;13:3515–27.
13. Ramon MA, Ter Riet G, Carsin AE, Gimeno-Santos E, Agustí A, Antó JM, et al., the PAC-COPD Study Group. The dyspnoea-inactivity vicious circle in COPD: development and external validation of a conceptual model. *Eur Respir J.* 2018;52, pii:1800079.
14. Pleguezuelos E, Guirao L, Moreno E, Samitier B, Ortega P, Vila X, et al. Safety of rehabilitation program for COPD patients. *Arch Bronconeumol.* 2018;54:111–2.
15. Pleguezuelos E, Pérez ME, Guirao L, Samitier B, Ortega P, Vila X, et al. Improving physical activity in patients with COPD with urban walking circuits. *Respir Med.* 2013;107:1948–56.